Propositions associated with the PhD thesis

LIGHT AND SHADOWS OF CITY LIFE
Consequences of urbanisation for oxidative stress balance of the house sparrow

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1. Urban areas are complex ecological systems dominated by humans[1]. They present many novel challenges to wildlife, but also new opportunities for some species that are able to exploit them[2].

[1]Alberti, 2008. *Advances in urban ecology: integrating humans and ecological processes in urban ecosystems.* [2]McKinney, 2006. *Urbanization as a major cause of biotic homogenization.*

2. The house sparrow is considered a model species of an urban exploiter[1]. However, in recent decades the urban populations have declined up to 90% in the most urbanised areas of Europe[2]. This mismatch may be related to the quick and extreme changes that have happened in cities, exceeding the adaptive capacity of the species.

[1]McKinney, 2002. *Urbanization, biodiversity, and conservation.* [2]De Laet and Summer-Smith, 2007. *The status of the urban house sparrow Passer domesticus in north-western Europe: a review*.

3. The oxidative stress balance constitutes a reliable biomarker for monitoring urban environmental quality.

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4. Urban environments increase oxidative stress of house sparrows. Differences between urban and rural populations are larger in the breeding season, when scarcity of antioxidants may have negative consequences for parents and their offspring.

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5. In cities, food is plenty but of low quality: diets based on processed food promote an oxidative stress misbalance and a deficiency of ω3-polyunsaturated fatty acids.

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6. The consequences for house sparrows living in an urban environment are an overall imbalance of oxidative stress, because of the sum effect of pollution and poor-quality food sources in cities. They are paying the cost of the investment in the self-maintenance of oxidative balance with potentially negative consequences for the fitness; this may be related to the decline of the urban populations reported in European cities.

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7. Environmental education programs for householders and schools are needed to improve the coexistence between citizens and urban wildlife.

8. Ecophysiological studies use techniques developed and traditionally used in human health. Early career researchers should get a training opportunity in methods and techniques from field/wet/dry lab to realise the advantages of cooperation between disciplines and open up their minds to new challenges.

9. Science should play a significant role in society and governments have the responsibility of ensuring their scientific heritage. Furthermore, scientists have the obligation to share their knowledge and advances not only with the scientific community, but also with the society.